

L. Forcemain is to be tested in accordance with the following:

1. The forcemains shall be filled with water, supplied by the Contractor, as directed by the Town, and the pressure raised to obtain a minimum test pressure measured at the highest point of the section of pipeline under test. Particular care shall be taken to eliminate all air from pipeline. The forcemains shall be subject to pressure and leakage test as specified in Section 2 for watermains at the specified test pressure, measured at the highest point of the section of pipeline under test. This test shall be a minimum of four (4) hours duration. All visible leaks shall be repaired by the Contractor at no expense to the Town. The Contractor shall make any and all repairs at his or her expense that may be necessary until the leakage test requirements have been met.

END OF SECTION

## **SECTION 2D - STORM DRAINS AND APPURTENANCES**

### **1.01 GENERAL**

- A. This section covers storm sewer pipe, precast manholes and precast catch basins.
- B. The Contractor shall furnish and install all storm drains and appurtenances as specified herein and as defined on the Drawings or as directed by the Engineer.
- C. The Contractor shall submit certifications to the Engineer that all pipe, fittings and joints are as specified herein.

### **1.02 REINFORCED CONCRETE PIPE**

- A. Pipe shall be manufactured without lifting holes and shall be handled at all times by means of slings or other methods approved prior to start of construction. Defective or damaged pipe shall not be utilized.
- B. Pipe manufactured shall meet the applicable strength requirements contained in ASTM Designation C-76, Reinforced Concrete Culvert, Storm Drain and Sewer Pipe, minimum circumferential reinforcement shall be as prescribed for Class III. Class IV pipe shall be provided where depth of cover is less than two (2') feet.

### **1.03 STEEL (CORRUGATED METAL) PIPE**

Steel (Corrugated Metal) pipe shall be galvanized bituminous coated corrugated steel pipe conforming to Section 614 of the Delaware D.O.T. Standard Specifications for road and bridge construction. It shall be suitable for H-20 live loading.

### **1.04 CORRUGATED ALUMINUM PIPE**

Aluminum pipe shall be furnished in accordance with Section 615 of the ~~1985~~ Delaware D.O.T. Standard Specifications for road and bridge construction. It shall be suitable for H-20 live loading.

### **1.05 ADS PIPE**

ADS storm drain shall be N12 ASTM D2321 for pipe and fittings. ADS storm drain shall not be allowed if depth of cover is less than 18".

### **1.06 PIPE AND FITTINGS**

- A. Pipe laying shall not begin until all stakeout and cut sheets have been approved by the Engineer.
- B. The Contractor shall utilize proper and suitable tools and equipment for the safe handling and laying of the pipe and fittings in accordance with the manufacturer's standards. Pipe and fittings shall be carefully handled and lowered into the trench.
- C. Should the pipe require cutting to fit in the line or to bring it to the required

location, the work shall be done without extra compensation, in a satisfactory manner so as to leave a smooth end perpendicular to the axis of the pipe.

- D. Before making joints, each pipe shall be well bedded on a solid foundation and no pipe shall be brought into position until the preceding length has been thoroughly embedded and secured in place. No pipe shall be laid in wet trench conditions that preclude proper bedding or on a frozen trench bottom, or when in the opinion of the Engineer, the trench or weather conditions are unsuitable for proper installation.
- E. In laying pipe, special care shall be taken to insure that each length shall abut against the next in such a manner that there shall be no shoulder or unevenness of any kind along the inside of the pipeline.
- F. No wedging or blocking will be permitted in laying any pipe unless by written order from the Engineer.
- G. Pipe and appurtenances shall be thoroughly cleaned before they are laid and shall be kept clean until the acceptance of the completed work. The open end shall be kept closed with a plug until the next length is laid. At the close of work each day, the end of the pipeline shall be tightly closed with an expansion stopper so that no dirt or other foreign substances may enter the line, and this stopper shall be kept in place until pipe laying is again resumed.
- H. Manholes shall be built as pipe laying progresses.
- I. Coupling bands for steel and aluminum corrugated metal pipes shall be of the one piece lap-type coupling. No single band couplers will be allowed.

#### 1.07 PRECAST CONCRETE MANHOLES AND INLETS

- A. The Contractor shall construct manholes and inlets of precast reinforced concrete risers and base sections as indicated on the plans.
- B. Manholes and inlets shall be built as such points on the pipelines and of such form and dimensions as are shown on the drawings or as may be directed. Manholes and inlets shall be built as pipe laying progresses.
- C. Precast reinforced concrete risers, eccentric cones and bases shall be as detailed on the plans and in conformance with ASTM Designation C-478. Joints between riser sections shall be fitted with an "O" ring rubber gasket, meeting the requirements of ASTM Designation C-443. Installation of risers shall be in accordance with manufacturer's recommendations.
- D. Precast reinforced concrete base riser sections shall be as manufactured by Atlantic Concrete Company, Virginia Precast Corporation or equal.
- E. Interior and exterior joint spaces of all manhole and inlet risers shall be filled prior to application of the exterior waterproofing. The interior and exterior joint shall be mortared.
- F. Lifting holes in the walls of precast reinforced concrete risers will be allowed, but

shall be plugged with rubber stoppers and grouted flush with face of manhole and inlets riser sections. Not more than two (2) holes shall be cast in the walls of each riser section for the purpose of handling.

- G. The exterior surface of all precast manholes and inlets shall receive a minimum two (2) coat application of sixty-eight (68%) percent solid coal tar type protective coating. The total average dry film thickness shall measure 24 mils with no single measurement to be less than 20 mils. Surfaces shall be prepared in accordance with the manufacturer's instructions and coatings applied in the field in an acceptable manner.
- H. Inlet flow channels and benches shall be constructed of brick with care taken to secure smooth and even surfaces. Channel sections shall be built up to true line and radius, and curved sections shall provide a uniform transition in the flow direction. Materials and construction of flow channels shall be in accordance with appropriate sections for materials so used, as hereinbefore specified.
- I. Concrete utilized in poured in place structures shall have compressive strength of 3000 psi while precast concrete shall have a compressive strength of 4000 psi in 28 days.

#### 1.08 CASTINGS

- A. Manhole frames and covers shall be set by the Contractor as the work progresses. The frame shall be well bedded in mortar.
- B. Material for frames and covers shall be in accordance with the standard specifications for gray iron castings ASTM Designation A-48 for Class No. 35.
- C. All frames and covers shall be of the sizes and types detailed on the plans.
- D. Manhole frames and covers shall be installed on grade to match the slope of the paved surface. Use brick adjustment courses or manufactured adjustment rings grouted in place between the cone and frame for adjustment to match the slope of the paved surface.
- E. Inlet gratings shall conform with the detail shown on the plans and/or section 708.06 of the Delaware Department of Transportation Standard Specifications.

#### 1.09 BRICK AND MORTAR FOR INLET FLOW CHANNELS

- A. All brick shall conform to the "Standard Specifications for Sewer Brick", ASTM C-32, Grade SS.
- B. Mortar shall be in accordance with the "Standard Specifications for Portland Cement", ASTM C-150 for Type II.

#### 1.10 MANHOLE AND INLET STEPS

- A. Manhole and inlet steps shall be made of 3/8-inch diameter (No. 3) steel bars, ASTM Designation A-615, Grade 60, encased in polypropylene plastic. Manhole steps shall have tread ridge with retainer lug on each side.

- B. Manhole and inlet steps shall be cast-in-place during manufacture of precast reinforced concrete risers and eccentric top sections or embedded during construction of brick manholes. Embedment length shall be suitable for minimum five (5") inch thick, precast reinforced concrete riser walls or eight (8") inch thick brick manhole walls.
- C. Manhole and inlet steps shall be OSHA approved and as manufactured by M.A. Industries, Inc., Peachtree City, Georgia, ICM, Inc., Jacksonville, Arkansas or equal.
- D. Manhole steps shall be spaced twelve (12") inches apart. The maximum spacing from top of manhole to the first step shall not exceed sixteen (16") inches.

#### 1.11 DETECTION TAPE

- A. Pipeline detectable tape shall be installed continuously along all storm drain. The tape shall be installed directly above drain and six (6") inches from the ground surface.
- B. The tape shall be Lineguard Type II Detectable Tape as manufactured by Lineguard, Inc. of Wheaton, Illinois or equal. The tape shall be a minimum of two (2") inches wide, white in color, imprinted with the words "CAUTION -- STORM DRAIN BELOW" and be capable of being detected with inductive methods.

#### 1.12 STORMWATER MANAGEMENT IN SUBDIVISIONS

- A. The elevation of all new lots shall be greater than the adjacent sidewalk elevation or adequate drainage shall be provided.
- B. Stormwater Management Ponds (Requirements are in addition to Soil Conservation Service permit stipulations.)
  - 1. Each manmade pond shall be enclosed by fencing. The fencing shall be erected a minimum of fifteen feet away from the perimeter of the pond.
  - 2. Banks of ponds shall be sloped 2:1 or less.
  - 3. Pond must be easily accessible for vehicles from public street for purposes of maintenance.
  - 4. Area surrounding pond shall be properly restored according to Section 8 of these specifications.
  - 5. No pond shall be constructed unless adequate outflow is provided. Infiltration ponds are not acceptable.
  - 6. Wet ponds must have 10-foot wide benches.
  - 7. Soil borings used in pond design must be submitted to Town.

END OF SECTION

## **SECTION 2E - CONCRETE SIDEWALKS, CURB AND GUTTER AND DRIVEWAYS**

### **1.01 GENERAL**

- A. Contractor shall provide all labor, materials and appurtenances for construction of concrete sidewalk, curb and gutter where indicated on the drawings and as specified.
- B. The Contractor shall furnish and install PVC pipe sleeves in sidewalk areas designated by the Town for street signs.

### **1.02 METHODS AND MATERIALS**

- A. All materials and construction methods shall be in accordance with the Delaware Department of Highways and Transportation Standard Specifications dated July, 1985 and Supplements thereto. Integral concrete curb and gutter shall be constructed per Section 704. Concrete sidewalks shall be constructed per Section 705. Parkway curbing shall be constructed per Section 703.
- B. All concrete shall be according to Delaware Standard Specifications Section 812, Class B. Minimum ultimate compressive strength of concrete shall be 3,000 pounds per square inch at the end of 28 days. Submit mix design for approval. All concrete shall be air entrained.
- C. The Contractor shall retain the services of an independent testing agency to perform concrete testing. He shall schedule one (1) set of test cylinders for every 20 cubic yards of concrete placed as curb and gutter or sidewalk. The testing agency shall be responsible for sample preparation, transportation, testing and submission of testing reports. Testing shall include slump test, air content, ambient temp, concrete temp and 7-day and 28-day compression tests. Test results shall be submitted, in duplicate, direct by the testing agency, to the Engineer. The cost of all concrete testing shall be included in the prices bid for sidewalk, curb and gutter.
- D. Curbs shall be depressed at all existing driveway locations in accordance with Delaware State Standard Details, including proper preparation of subgrade and proper placing and spacing of joints and joint materials.
- E. The Contractor shall permanently repair or relay all curbs, sidewalks and driveways that have been removed broken, or otherwise injured in executing any of the work under the contract or injured by settlement of any backfilled excavation at any time prior to termination of the contract and guarantee period.
- F. Cost of reconstruction of curbs, sidewalks and concrete driveways during construction shall be included within the appropriate unit and/or lump sum prices bid for furnishing and laying pipe and appurtenances.
- G. New curb and sidewalk or replacement of areas damaged during construction shall be installed in accordance with State of Delaware Department of Transportation standards. Install wheelchair curb ramps at all street corners constructed.

### 1.03 SUBBASE

Subbase for concrete sidewalk and integral curb and gutter shall be clean, well graded select material. Select material shall be well graded sand or bank-run sand gravel per Delaware Department of Highways and Transportation Standard Specifications, Section 302. Compact to at least ninety-five (95%) percent of maximum density at optimum moisture content as determined by the Modified Proctor Test AASHTO T-99, Method A.

### 1.04 RECONSTRUCTION OF PRIVATE DRIVEWAYS

Saw cut existing driveways if sections are acceptable for re-use. Prior to replacement of driveways, the Contractor, Engineer and Town shall review field conditions. The Town will designate the extent of additional removal and replacement which shall not entitle the Contractor to additional compensation above the unit prices bid. Upon completion of utility construction, the Contractor shall reconstruct private driveways in kind except as follows:

#### A. Concrete Driveways

1. Concrete driveways shall be replaced and reconstructed upon a properly prepared, graded and compacted subgrade and in compliance with Delaware D.O.T. Standard Specifications and Details.
2. Driveways shall be constructed to a minimum thickness of 6-inches and shall be reinforced with 6-inch by 6-inch wire mesh of 10-10 gauge. Commercial driveways shall be constructed of 8 inches concrete reinforced with 6-inch by 6-inch wire mesh of 10-10 gauge.
3. Restoration shall provide for a smooth transition from back of sidewalk or driveway construction to undisturbed areas and shall be free of all localized depressions or abrupt changes in grade that may trap or otherwise misdirect surface drainage or represent possible damage to vehicular travel.

#### B. Bituminous Concrete Driveways

1. Bituminous driveways and parking areas disturbed through the Contractor's construction operations shall be restored by a minimum of 2-inches of hot-mix bituminous concrete pavement Type C placed in a single lift onto a base course consisting of 4-inches of properly prepared and compacted crushed stone or quarry waste. Commercial and residential entrances on State maintained streets shall be in accordance with the plan details. Match existing thickness where condition exceeds minimum restoration.
2. The hot-mix bituminous concrete surface shall conform to the Delaware D.O.T. Standard Specifications for Type C and shall be constructed in accordance with the applicable Articles of Section 401 "Hot-Mix, Hot Laid Bituminous Concrete Pavement".
3. The subgrade shall be properly prepared, graded and compacted in accordance with Section 1 of these Specifications.

#### 1.05 SIDEWALK CONSTRUCTION (REPLACEMENT)

- A. Concrete sidewalks shall be replaced as required, or as directed, in accordance with Section 705 of the Delaware D.O.T. Standard Specifications. Handicapped ramps shall be replaced or provided new in all intersections.
- B. Sidewalks in areas not subject to vehicular loading shall have a minimum thickness of 4-inches placed upon a properly prepared, graded and compacted subgrade.
- C. Sidewalks in vehicular loading areas shall be a minimum thickness of 6-inches (8" in commercial vehicular areas) reinforced with 6-inch by 6-inch wire mesh of 10-10 gauge. Subgrade shall be prepared as stated for non-load areas.
- D. Replacement of partial sections of concrete sidewalk, where so directed, shall be extended to the nearest existing joint in each direction.
- E. Sidewalks shall be replaced to a width equal to that existing prior to start of construction and such width shall be maintained throughout the entire length of the block. In no instance shall the constructed width be less than four (4') feet.
- F. A broom finish shall be applied perpendicular to the direction of traffic.
- G. Cracked sidewalk shall be removed and replaced at Contractor's expense.

#### 1.06 SIDEWALK CONSTRUCTION (NEW SUBDIVISION)

- A. Sidewalks shall be constructed in 4-foot sections with maximum length of 20 feet. A 1/2-inch expansion joint shall be placed across the walk every 20 feet, at a minimum.
- B. The sidewalk shall be marked into rectangular slabs 5 feet in length by scoring 1/2 inch minimum with approved edging tools. The surface edge of each slab shall be rounded to a 1/4-inch radius.
- C. The sidewalk shall be installed adjacent to curb with no grass strip or other plantings between the curb and sidewalk.
- D. Areas behind sidewalk shall be properly graded to provide drainage away from lot.
- E. Grass shall be established in areas adjacent to rear of sidewalk in a minimum of 4 inches of topsoil.
- F. Construction of sidewalks in new subdivisions must also adhere to Section 1.05 of these specifications.
- G. A broom finish shall be applied perpendicular to the direction of traffic.
- H. Cracked sidewalk shall be removed and replaced at Contractor's expense.

END OF SECTION

## **SECTION 2F - SURFACE RESTORATION**

### **1.01 GENERAL**

- A. The Contractor shall restore all surfaces damaged by his operations to the widths and extent detailed or noted on the plans or specified herein.
- B. Surface restoration in streets and roads maintained by the State Department of Highways shall be accomplished in accordance with applicable utility construction permits.
- C. Various conditions and types of surface restoration are shown on the details. Materials and construction methods to be in accordance with the following specification and the Delaware Department of Transportation Standard Specifications, latest edition.
- D. Existing pavement to be trimmed to secure a straight clean edge for repaving. Saw cut pavement as shown on the drawings and as directed to obtain a clean pavement edge.
- E. No staggered or irregular longitudinal trench repair widths shall be allowed in each block of work. Repairs shall be of a uniform width and in a straight line.
- F. Minimum pavement restoration width is four (4') feet including edge of roads. Actual width shall be as detailed or noted on the plans. Payment is limited to these widths. Should the Contractor damage or disturb larger areas, he shall replace the additional area at his cost.
- G. Surface course and concrete sections shall be lifted out not broken out.
- H. Undermined areas shall be grout filled or cut back.
- I. A temporary two (2") inch layer of cold patch shall be placed on all utility trenches at the end of every workday.
- J. Metal plating may be used at the end point of the utility laying operation and must be used to protect the integrity of concrete patches.
- K. All adjustments to existing utilities have to be made prior to overlay operations and have to be repeated if there is any damage due to rolling and compacting operations.
- L. Manhole or catch basin adjustments can be made with manhole adjustment rings, brick courses or mortar layers, valve boxes have to be screwed up; expansion section will not be allowed.
- M. All trenches have to be cut back by one (1') foot on each side.
- N. Skewed patches will not be permitted, they have to be boxed square.
- O. Paving operations can be performed with the following minimum temperatures:

1. 32 degrees for any deep lift larger than 2 inches.
2. 40 degrees for any hot mix type C larger than or equal to 2 inches.
3. 50 degrees for any hot mix type C less than 2 inches.

P. Lift thicknesses shall be limited to:

1. 2" for hot-mix (Minimum 1-1/2")
2. 6" for deep lift bituminous base course
3. 8" for backfill

Q. Catch basins, inlets, curbs and all other appurtenances shall be adequately covered and protected prior to application of bituminous materials. No earth or bituminous materials shall be allowed to enter any storm drainage system and suitable containment provisions shall be employed to prevent surface runoff of bituminous materials.

R. The final surface except on overlays, shall match grades existing prior to construction and shall be such that a smooth transition free of abrupt changes in grade is made with adjacent pavements and/or sidewalks. No depressions or other misalignment shall obstruct, trap or otherwise misdirect the flow of surface water drainage.

## 1.02 MAINTENANCE OF REFILLED EXCAVATIONS

- A. The Contractor shall maintain, at his own expense, all refilled excavations and surfacing in proper condition as specified herein. All depressions appearing in the refilled excavation, stabilized base and temporary paving shall be properly refilled. If the Contractor fails to make repairs within 48 hours after receipt of written notice from the Engineer, the Town may refill said depressions and the cost thereof shall be billed to the Contractor. In case of emergency, the Town may refill any depression or protect with barricades without giving previous notice to the Contractor, and the cost of so doing shall be billed to the Contractor.
- B. The Contractor shall be responsible for any injury or damage that may result from lack of maintenance of any refilled excavation at any time.

## 1.03 PAVEMENT SECTIONS

A. Bituminous Concrete Pavement

Hot mix, hot laid bituminous concrete shall consist of placing bituminous concrete wearing courses, Type C or Type D, on a prepared base to the minimum compacted thickness shown on the drawings. Hot mix, hot laid bituminous concrete shall meet the provisions of Section 401 of the Delaware D.O.T. Standard Specifications.

B. Base Courses

1. Graded Aggregate Base Course

Graded aggregate base course shall be spread on prepared and compacted refilled excavations to the compacted depth shown of the

drawing details. Materials and methods of construction shall meet the provisions of Section 302 of the Delaware D.O.T. Standard Specifications.

2. Bituminous Concrete Base Course (Deeplift)

Bituminous concrete base course shall be spread on prepared and compacted refilled excavations to the compacted depth shown on the details. Materials and methods of construction shall meet the provisions of Section 306 of the Delaware D.O.T. Standard Specifications.

3. Type B Bituminous Concrete Pavement

Type B bituminous concrete pavement shall be spread on prepared and compacted refilled excavations to the compacted depth shown on the details. Materials and methods of construction shall meet the provisions of section 401 of the Delaware D.O.T. Standard Specifications.

1.04 BITUMINOUS SURFACE TREATMENT

- A. Bituminous surface treatment shall consist of a number of courses of bituminous material and aggregate as shown on the drawings.
- B. Materials and methods of construction shall meet the provisions of section 404 of the Delaware D.O.T. Standard Specifications.

1.05 CONCRETE PAVEMENT

- A. Concrete used in the restoration of street and roads shall be placed to the minimum thickness shown on the drawings. Concrete may be a base course with a bituminous concrete overlay or a finished surface course as shown on the drawings.
- B. Concrete pavement shall meet the provisions of Section 500, "Rigid Pavement" of the Delaware D.O.T. Standard Specification.
- C. Concrete sidewalk, curb, gutter and driveway restoration shall meet the provisions of Sections 705, 702, 701 and 704 of referenced standard specification.
- D. During paving projects, all existing sidewalk corners or handicap ramps adjacent to the street shall be removed and replaced if they are not currently ADA compliant.

1.07 TOPSOIL AND SEEDING

- A. Topsoil shall be placed in areas where grass has been disturbed by the Contractor's operations. Depth of topsoil shall be four (4") inches minimum. Topsoil salvaged and stockpiled during trench and structure excavation may be used for this purpose. When topsoiling, all materials and methods of construction shall meet the provisions of Section 732 and 733 of the Delaware D.O.T. Standard Specifications.

- B. Seeding shall consist of furnishing and placing seed and soil supplements on topsoiled areas and at any other location, as directed by the Engineer. When seeding, all materials and methods of construction shall meet the provisions of Section 734 of the Delaware D.O.T. Standard Specification.
- C. Fertilizer shall be a recognized commercial fertilizer containing a minimum five (5%) percent nitrogen, ten (10%) percent available phosphoric acid and ten (10%) percent soluble potash by weight. It shall be applied in sufficient amounts to provide sixty (60) pounds of nitrogen per acre.
- D. Fertilizing and seeding application dates shall be in conformance with Section 734 "Seeding" of the Delaware D.O.T Standard Specifications as specified for "Standard Roadside Mix". Seed shall be applied at a rate of four (4) to five (5) pounds per 1,000 square feet.
- E. No mulch shall be required unless the area to be seeded rests upon a slope greater than 3 to 1. Mulch for these areas shall consist of straw mulch as specified in Section 735 "Mulching" of the Delaware D.O.T. Standard Specifications.

#### 1.08 NEW SUBDIVISION STREETS

- A. Minimum Requirements: All new subdivision streets shall be constructed of granular aggregate base compacted to 95% of ASTM D1557 Modified Proctor Method and 6" compacted depth, with 3-1/2" Type B bituminous concrete base course and 1.5" Type C bituminous concrete surface course. Pavement thickness may be greater if soil or traffic conditions warrant.
- B. All subdivision entrances on state-maintained roads shall adhere to the Delaware D.O.T. Entrance Manual, latest revision.
- C. All designs for subdivision entrances on town-maintained roads must be approved by the Town.
- D. All streets must have a minimum longitudinal slope of 0.5%. Cross slopes must be as detailed.

#### 1.09 LIGHTING

- A. All subdivision streets shall be lighted with decorative fiberglass lamp posts and 100W high-pressure sodium lamps unless otherwise approved. Lighting fixtures shall be Salem Series by Holophane or as otherwise approved by the Town Planning Commission.
- B. The wiring for the street lighting shall be directly buried or placed in PVC conduit and meet all applicable electrical codes.
- C. The lamps shall have a maximum spacing of 150 feet. A lamp must be placed at every street corner and subdivision entrance.

- D. The lamps shall be placed outside the sidewalk and within the right-of-way line or easement. The maximum distance the lamps shall be placed behind the sidewalk is one foot.
- E. Globe shall be utility Granville Single Globe or as otherwise approved by the Planning Commission. Use Type 3 optics along sidewalks (directs downward). Use Type 5 optics in median and at intersections (spreads light).

END OF SECTION

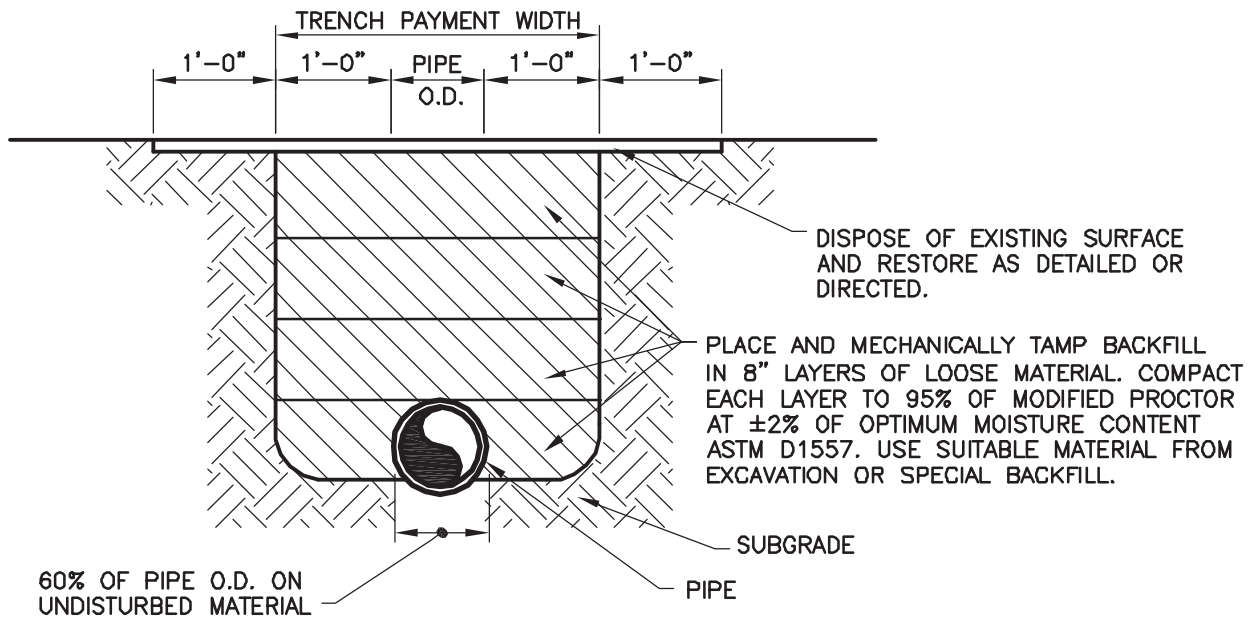
SECTION 3  
STANDARD DETAILS

## **STANDARD DETAILS LIST**

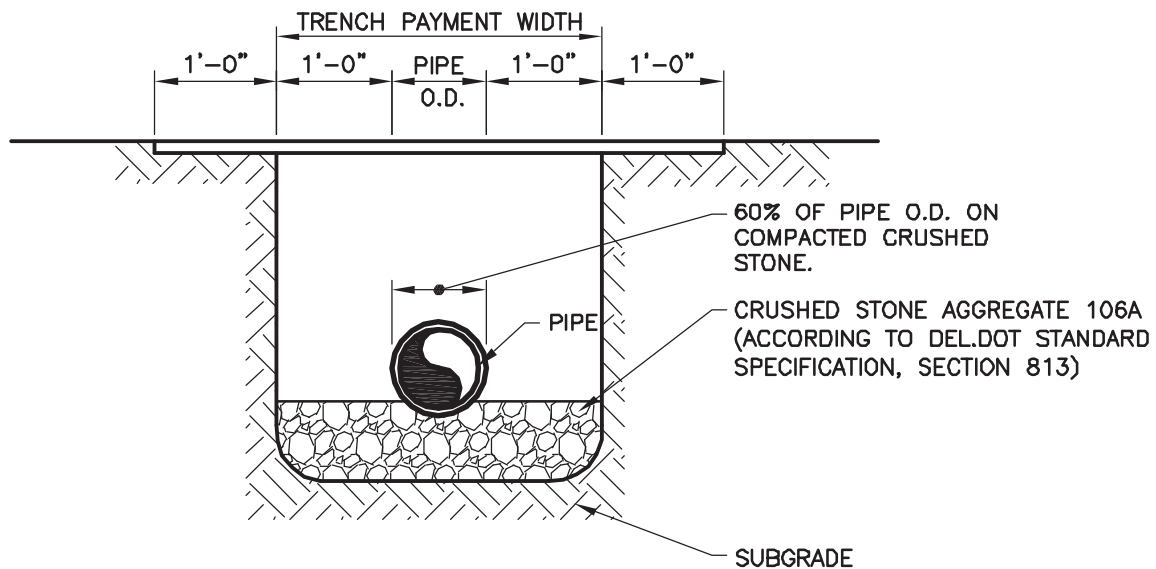
Trench Backfill and Pipe Bedding	D-2A-1
Industrial/Commercial Installation	D-2B-1
Fire Hydrant	D-2B-2
Tee and Wye	D-2B-3
Cross	D-2B-4
Horizontal Bend	D-2B-5
Plug	D-2B-6
Vertical Upward Bend	D-2B-7
Vertical Downward Bend	D-2B-8
Moled Water Service and Restoration	D-2B-9
Standard Single Meter Pit (Prefabricated)	D-2B-10
Double Lot Standard Dual Meter Pit (Prefabricated)	D-2B-11D
Single Lot Standard Dual Meter Pit (Prefabricated)	D2B-11S
2" Service Line	D-2B-12
2" Meter Setter	D-2B-13
Gang Meter Pit - Plan	D-2B-14
Gang Meter Pit - Section	D-2B-15
Industrial/Commercial Meter	D-2B-16
Fire Line Backflow Preventer	D-2B-17
Precast Shallow Manhole	D-2C-1
Precast Concrete Manhole	D-2C-2
Inside Drop Manhole	D-2C-3
Outside Drop Manhole	D-2C-4
Doghouse Manhole	D-2C-5
Typical Manhole Flow Channel	D-2C-6
Manhole Frame and Cover	D-2C-7
Sewer Lateral Restoration	D-2C-8
Building Lateral Cleanout	D-2C-9
Cleanout Lid	D-2C-10
Grease Trap	D-2C-11
Force Main Connection	D-2C-12
Catch Basin	D-2D-1
Sidewalk	D-2E-1
Sidewalk Handicap Ramp at Corner	D-2E-2
Driveway Curb Cut	D-2E-3
Driveway Curb Cut	D-2E-3.1
Concrete Curb and Gutter	D-2E-4
Temporary Cross Road and Longitudinal Patch	D-2F-1
Permanent Cross Road and Longitudinal Patch	D-2F-2
Overlay	D-2F-3
Transition	D-2F-4
Typical Section - Collector Street	D-2F-5
Typical Section - Minor Street	D-2F-6

Typical Section Detail  
Residential Alley & Asphalt Bike Trail  
Lamp Post  
Department of Justice Curb Ramps

D-2F-6.1  
D-2F-7  
D-2F-8.1  
4.7



## TRENCH BACKFILL



## CRUSHED STONE BEDDING

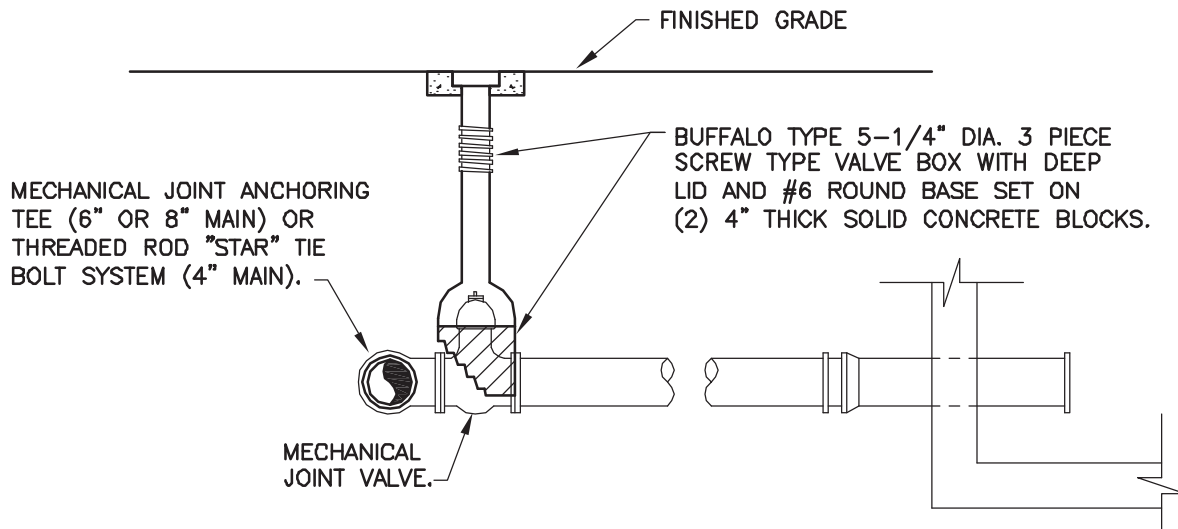
**DATE: SEPTEMBER 2007**

**TOWN OF BRIDGEVILLE  
CONSTRUCTION STANDARDS**

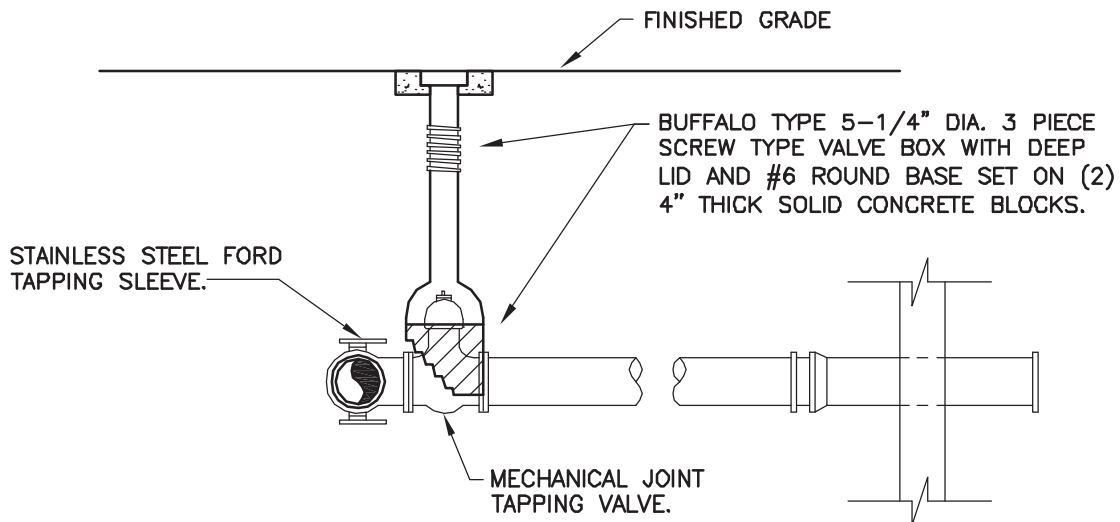
**TRENCH BACKFILL & PIPE BEDDING DETAIL  
NO SCALE**

**SECTION - 3**

**DRAWING: D-2A-1**



## NEW MAIN INSTALLATION



## EXISTING MAIN INSTALLATION

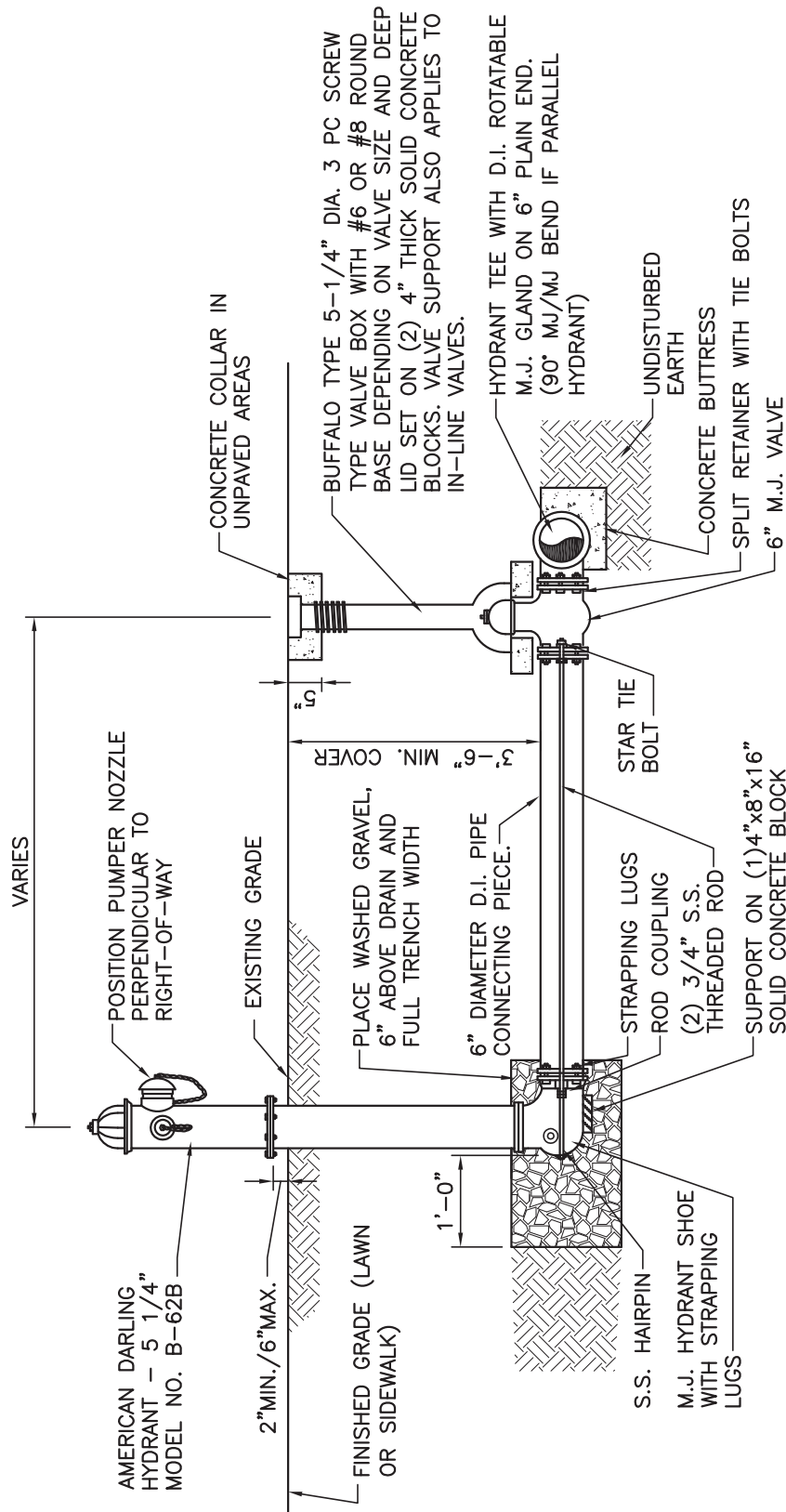
**DATE: SEPTEMBER 2007**

**TOWN OF BRIDGEVILLE  
CONSTRUCTION STANDARDS**

**INDUSTRIAL / COMMERCIAL  
INSTALLATION DETAIL NO  
SCALE**

**SECTION - 3**

**DRAWING D-2B-1**



**NOTE:**  
LOCATE HYDRANT MAXIMUM 7' FROM EDGE OF TRAVEL LANE.

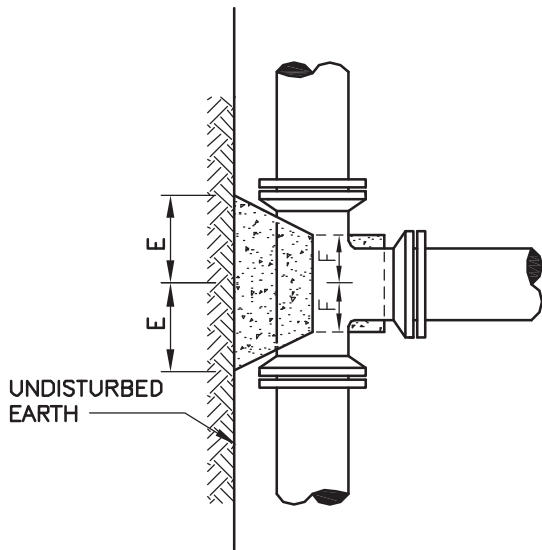
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**TOWN OF BRIDGEVILLE  
CONSTRUCTION STANDARDS**

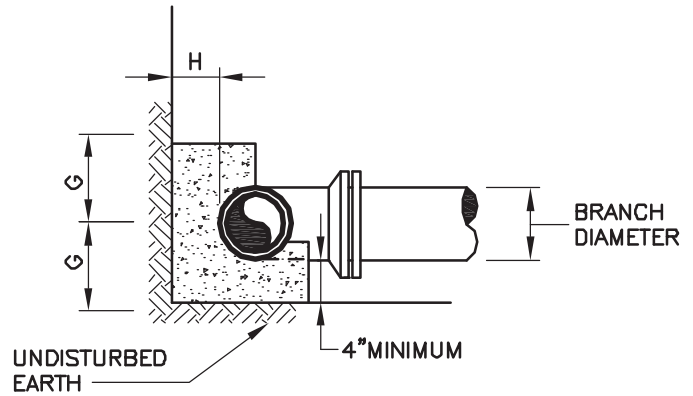
**FIRE HYDRANT DETAIL  
NO SCALE**

**SECTION - 3**

**DRAWING D-2B-2**



PLAN



PROFILE

DIMENSION SCHEDULE									
BRANCH DIA.	4"	6"	8"	10"	12"	16"	18"	20"	24"
E	8"	8"	10"	1'-0"	1'-3"	1'-8"	2'-0"	2'-6"	2'-9"
F	6"	6"	8"	8"	8"	10"	1'-0"	1'-0"	1'-2"
G	7"	7"	9"	1'-0"	1'-2"	1'-6"	2'-0"	2'-6"	2'-9"
H	8"	8"	9"	10"	1'-0"	1'-2"	1'-4"	1'-5"	1'-6"

\* USE OF BAGGED CONCRETE IS PROHIBITED.

**DATE: SEPTEMBER 2007**

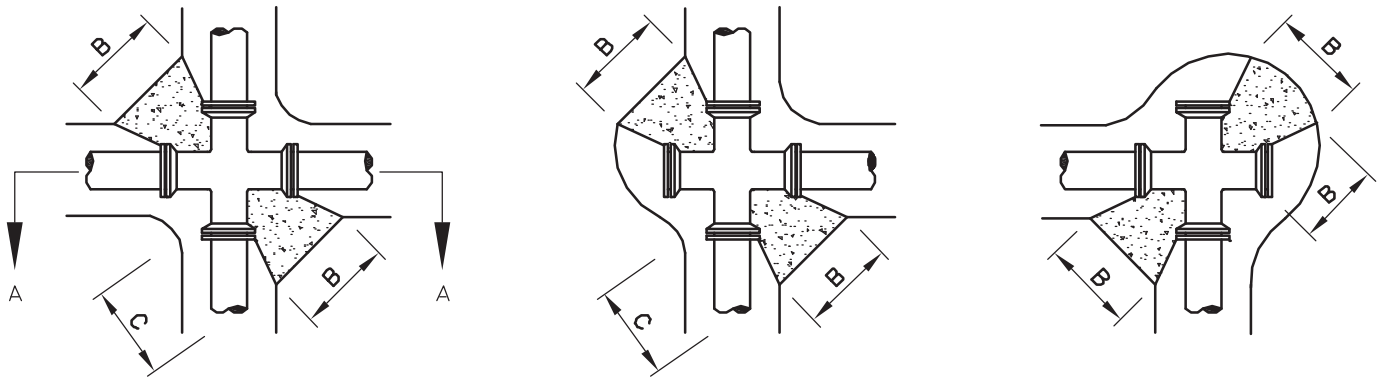
**TOWN OF BRIDGEVILLE  
CONSTRUCTION STANDARDS**

**TEE AND WYE DETAIL  
NO SCALE**

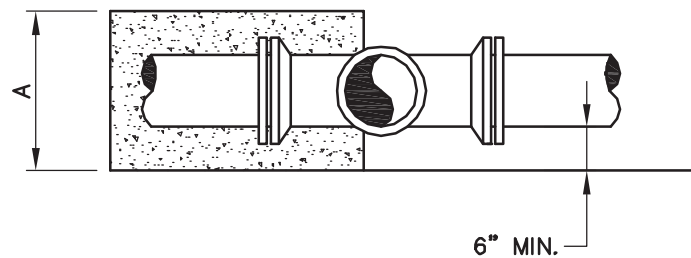
**SECTION - 3**

**DRAWING D-2B-3**

P:\STANDARD\DETAILS\City Details\Bridgeville DE\D-2B-4.DWG May 02, 2008 - 9:52am, (neug)



PLAN VIEW



SECTION A

DIMENSION SCHEDULE							
LARGEST BRANCH DIA.	4"	6"	8"	10"	12"	16"	24"
A	1'-9"	1'-9"	2'-6"	3'-0"	3'-3"	3'-9"	4'-6"
B	1'-2"	1'-2"	1'-4"	2'-0"	2'-2"	2'-6"	3'-6"
C	2'-6" MIN. TO UNDISTURBED SOIL.						

\* USE OF BAGGED CONCRETE IS PROHIBITED.

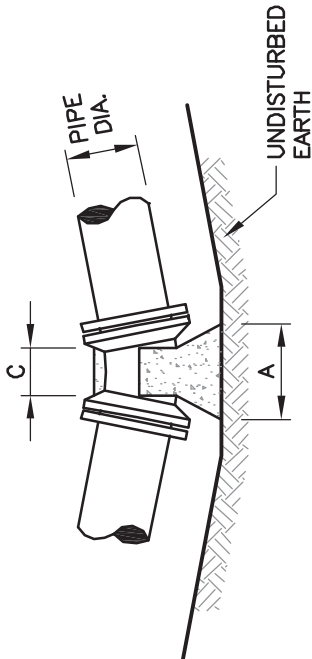
**DATE: SEPTEMBER 2007**

**TOWN OF BRIDGEVILLE  
CONSTRUCTION STANDARDS**

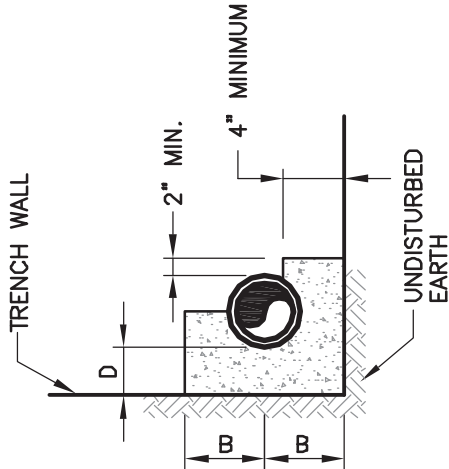
**CROSS DETAIL  
NO SCALE**

**SECTION - 3**

**DRAWING D-2B-4**



PLAN



PROFILE

DIMENSION SCHEDULE																			
BEND		11½'								22½'									
PIPE DIA.	4"	6"	8"	10"	12"	16"	18"	20"	4"	6"	8"	10"	12"	16"	18"	20"	24"		
A	6"	6"	6"	10"	1'-0"	1'-4"	2'-0"	2'-2"	9"	9"	1'-0"	1'-6"	1'-9"	2'-3"	2'-3"	2'-8"	3'-0"		
B	7"	7"	8"	9"	10"	1'-0"	1'-6"	1'-6"	7"	7"	8"	9"	10"	1'-0"	1'-0"	1'-6"	1'-6"		
C	4"	4"	6"	6"	10"	1'-0"	1'-6"	1'-6"	4"	4"	6"	8"	10"	1'-0"	1'-0"	1'-2"	1'-6"		
D	7"	7"	7"	8"	8"	9"	1'-0"	1'-2"	8"	8"	9"	10"	11"	1'-2"	1'-2"	1'-4"	1'-8"		
BEND		45'								90'									
PIPE DIA.	4"	6"	8"	10"	12"	16"	18"	20"	4"	6"	8"	10"	12"	16"	18"	20"	24"		
A	1'-3"	1'-3"	1'-8"	2'-1"	2'-6"	3'-4"	4'-0"	4'-0"	2'-0"	2'-0"	2'-6"	3'-0"	3'-6"	5'-0"	5'-0"	6'-0"	5'-6"		
B	7"	7"	8"	9"	1'-1"	1'-3"	2'-0"	2'-6"	6"	6"	9"	1'-0"	1'-3"	1'-6"	1'-6"	3'-0"	2'-0"		
C	4"	4"	6"	8"	10"	1'-0"	1'-6"	1'-6"	4"	4"	6"	8"	10"	1'-0"	1'-0"	1'-6"	1'-6"		
D	8"	8"	9"	10"	11"	1'-2"	1'-4"	1'-6"	1'-5"	1'-5"	1'-7"	1'-8"	1'-9"	1'-10"	1'-10"	2'-0"	2'-4"		

\* USE OF BAGGED CONCRETE IS PROHIBITED.

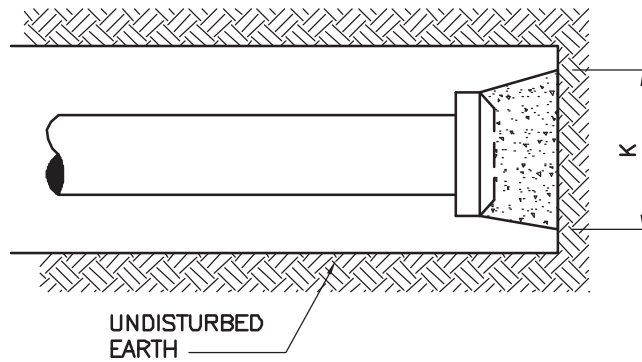
DATE: SEPTEMBER 2007

TOWN OF BRIDGEVILLE  
CONSTRUCTION STANDARDS

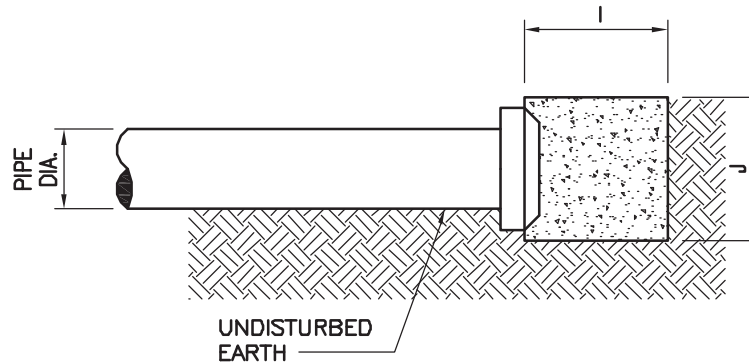
HORIZONTAL BEND DETAIL  
NO SCALE

SECTION - 3

DRAWING D-2B-5



PLAN



PROFILE

DIMENSION SCHEDULE									
PIPE DIA.	4"	6"	8"	10"	12"	16"	18"	20"	24"
I	6"	6"	8"	8"	10"	1'-0"	1'-4"	1'-6"	1'-8"
J	1'-0"	1'-0"	1'-4"	1'-8"	2'-0"	2'-8"	4'-0"	4'-6"	5'-0"
K	1'-5"	1'-5"	1'-11"	2'-5"	2'-10"	3'-9"	4'-0"	4'-6"	5'-0"

\* USE OF BAGGED CONCRETE PROHIBITED.

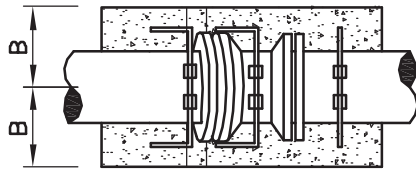
**DATE: SEPTEMBER 2007**

**TOWN OF BRIDGEVILLE  
CONSTRUCTION STANDARDS**

**PLUG DETAIL  
NO SCALE**

**SECTION - 3**

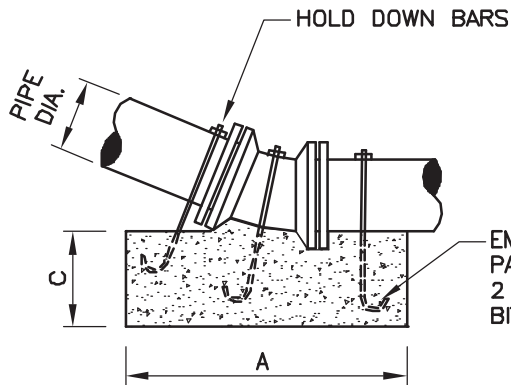
**DRAWING D-2B-6**



PLAN

DIMENSION SCHEDULE								
BEND		PIPE DIAMETER						
		4"	6"	8"	10"	12"	16"	24"
11 1/4°	A	1'-3"	1'-3"	1'-3"	1'-6"	1'-9"	2'-0"	2'-6"
	B	7"	7"	8"	9"	10"	1'-0"	1'-6"
	C	1'-0"	1'-0"	1'-0"	1'-3"	1'-3"	1'-3"	1'-6"
22 1/2°	A	1'-3"	1'-3"	1'-3"	1'-6"	1'-9"	2'-3"	3'-0"
	B	7"	7"	7"	8"	10"	1'-0"	1'-6"
	C	1'-0"	1'-0"	1'-0"	1'-3"	1'-3"	1'-3"	1'-6"
45°	A	1'-3"	1'-3"	1'-8"	2'-1"	2'-6"	3'-4"	4'-2"
	B	7"	7"	8"	9"	11"	1'-3"	2'-0"
	C	1'-0"	1'-0"	1'-0"	1'-3"	1'-3"	1'-3"	2'-0"

\* USE OF BAGGED CONCRETE IS PROHIBITED.



EMBED BARS 5" MINIMUM,  
PAINT EXPOSED BARS WITH  
2 COATS OF APPROVED  
BITUMINOUS PAINT.

PROFILE

BAR SCHEDULE			
SIZE	REINFORCING BARS		
	11 1/4°	22 1/2°	45°
4" & 6"	3 #4	3 #4	3 #4
8"	3 #4	3 #4	3 #4
10"	3 #5	3 #5	3 #5
12"	3 #5	3 #5	3 #5
16"	3 #5	3 #5	3 #5
18"	3 #6	3 #6	3 #6
20"	3 #6	3 #6	3 #6
24"	3 #6	3 #6	3 #6

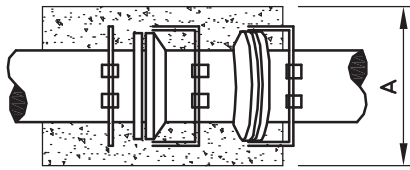
DATE: SEPTEMBER 2007

TOWN OF BRIDGEVILLE  
CONSTRUCTION STANDARDS

VERTICAL UPWARD BEND DETAIL  
NO SCALE

SECTION - 3

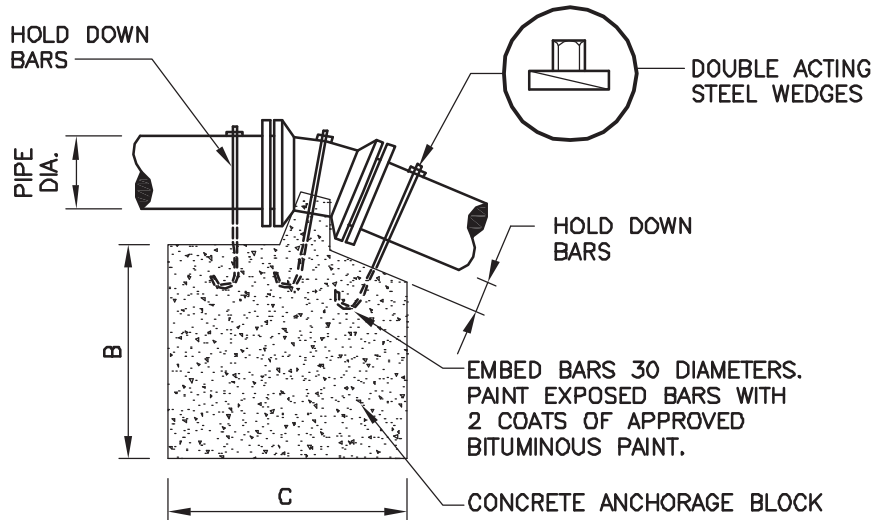
DRAWING D-2B-7



PLAN

DIMENSION SCHEDULE										
BEND		PIPE DIAMETER								
		4"	6"	8"	10"	12"	16"	18"	20"	24"
11 1/4°	A	1'-6"	1'-6"	1'-6"	2'-5"	3'-0"	3'-4"	3'-6"	3'-9"	4'-0"
	B	1'-3"	1'-3"	1'-9"	1'-9"	2'-0"	2'-4"	2'-6"	2'-9"	3'-0"
	C	2'-0"	2'-0"	2'-6"	2'-9"	3'-0"	3'-4"	3'-6"	3'-9"	4'-0"
22 1/2°	A	2'-0"	2'-0"	3'-4"	3'-8"	4'-0"	4'-4"	4'-6"	4'-9"	5'-0"
	B	1'-9"	1'-9"	2'-3"	2'-6"	2'-6"	3'-0"	3'-2"	3'-4"	3'-6"
	C	2'-6"	2'-6"	2'-8"	3'-10"	4'-0"	5'-4"	5'-6"	5'-9"	6'-0"
45°	A	2'-6"	2'-6"	3'-0"	4'-0"	4'-6"	5'-0"	5'-3"	5'-6"	5'-8"
	B	2'-6"	2'-6"	2'-9"	3'-0"	3'-6"	4'-4"	4'-6"	4'-9"	5'-0"
	C	3'-0"	3'-0"	4'-0"	4'-6"	4'-9"	5'-0"	5'-3"	5'-6"	5'-8"

\* USE OF BAGGED CONCRETE IS PROHIBITED.



PROFILE

BAR SCHEDULE			
SIZE	REINFORCING BARS		
	11 1/4°	22 1/2°	45°
4 & 6"	3 #6	3 #6	3 #6
8"	3 #6	3 #6	3 #6
10"	3 #6	3 #6	3 #6
12"	3 #6	3 #6	3 #6
16"	3 #6	3 #6	3 #6
18"	3 #8	3 #8	3 #8
20"	3 #8	3 #8	3 #8
24"	3 #8	3 #8	3 #8

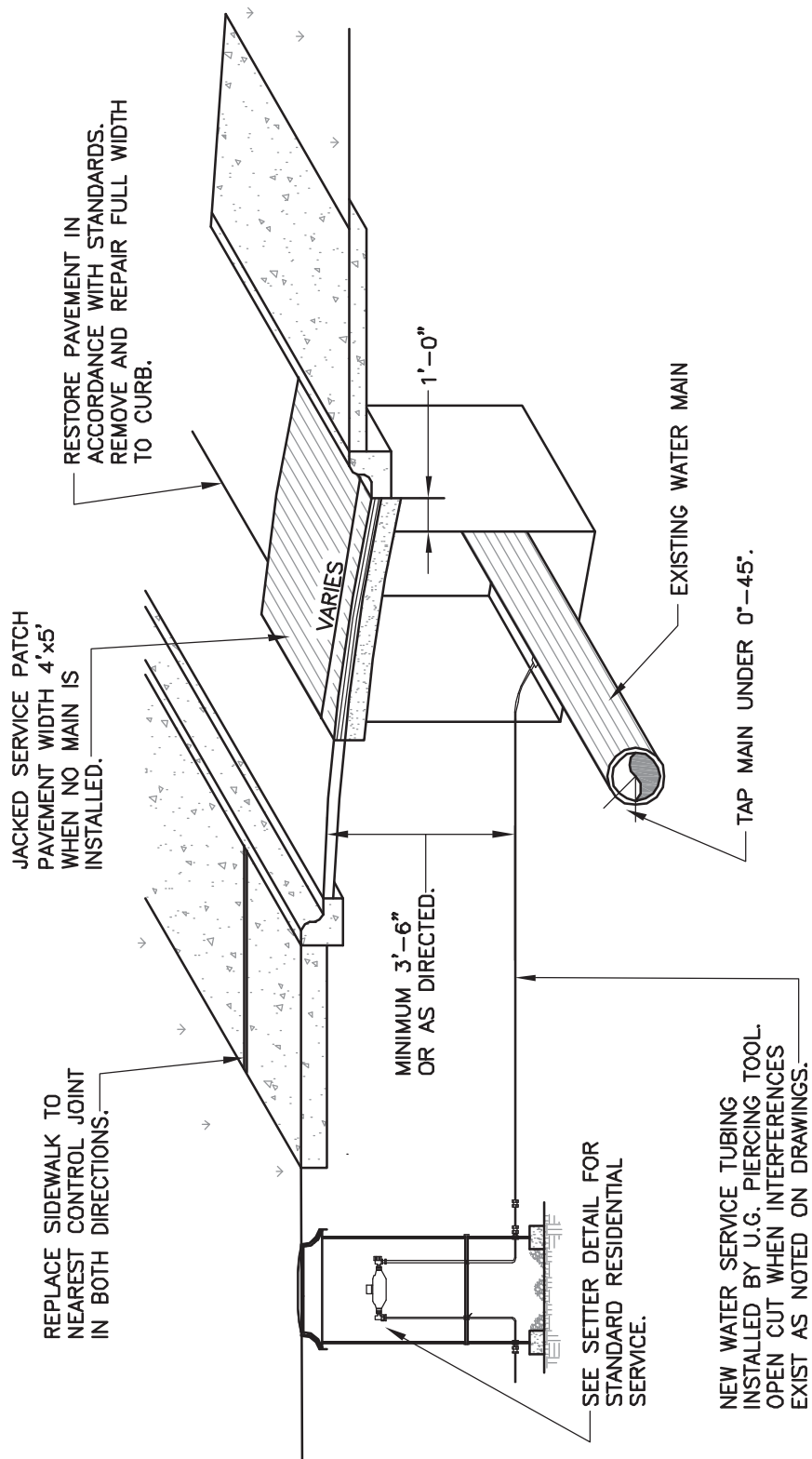
**DATE: SEPTEMBER 2007**

**TOWN OF BRIDGEVILLE  
CONSTRUCTION STANDARDS**

**VERTICAL DOWNWARD BEND DETAIL  
NO SCALE**

**SECTION - 3**

**DRAWING D-2B-8**



**DATE: SEPTEMBER 2007**

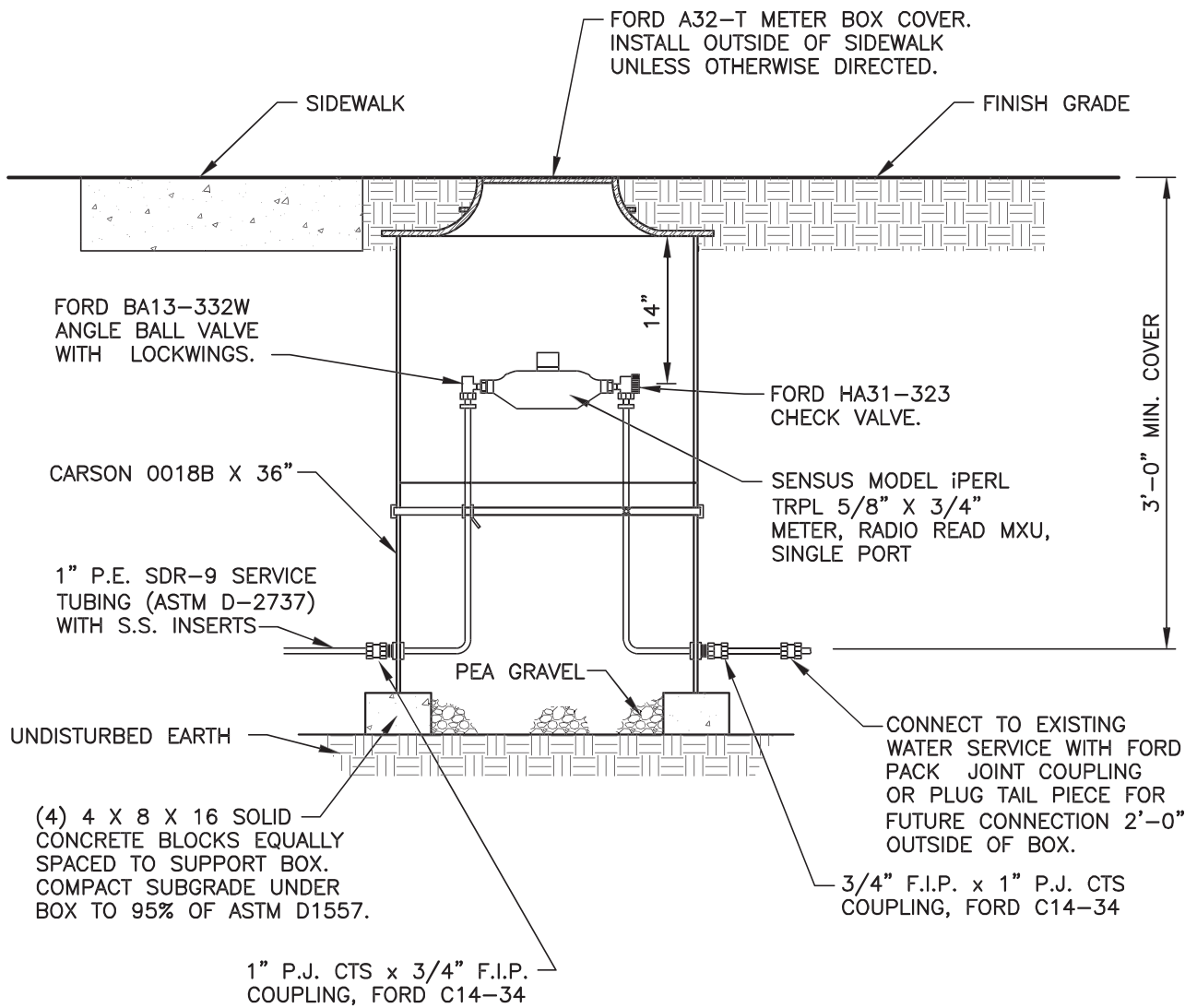
**TOWN OF BRIDGEVILLE  
CONSTRUCTION STANDARDS**

**MOLED WATER SERVICE AND  
RESTORATION DETAIL  
NO SCALE**

**SECTION - 3**

**DRAWING D-2B-9**

P:\STANDARD\DETAILS\8000 City Details\Bridgeville DE\D-2B-10.dwg Dec 11, 2017 - 11:30am, (neug)



**NOTE:**  
FOR SINGLE LIVING UNIT WITH  
NO IRRIGATION POTENTIAL

**DATE: SEPTEMBER 2007**

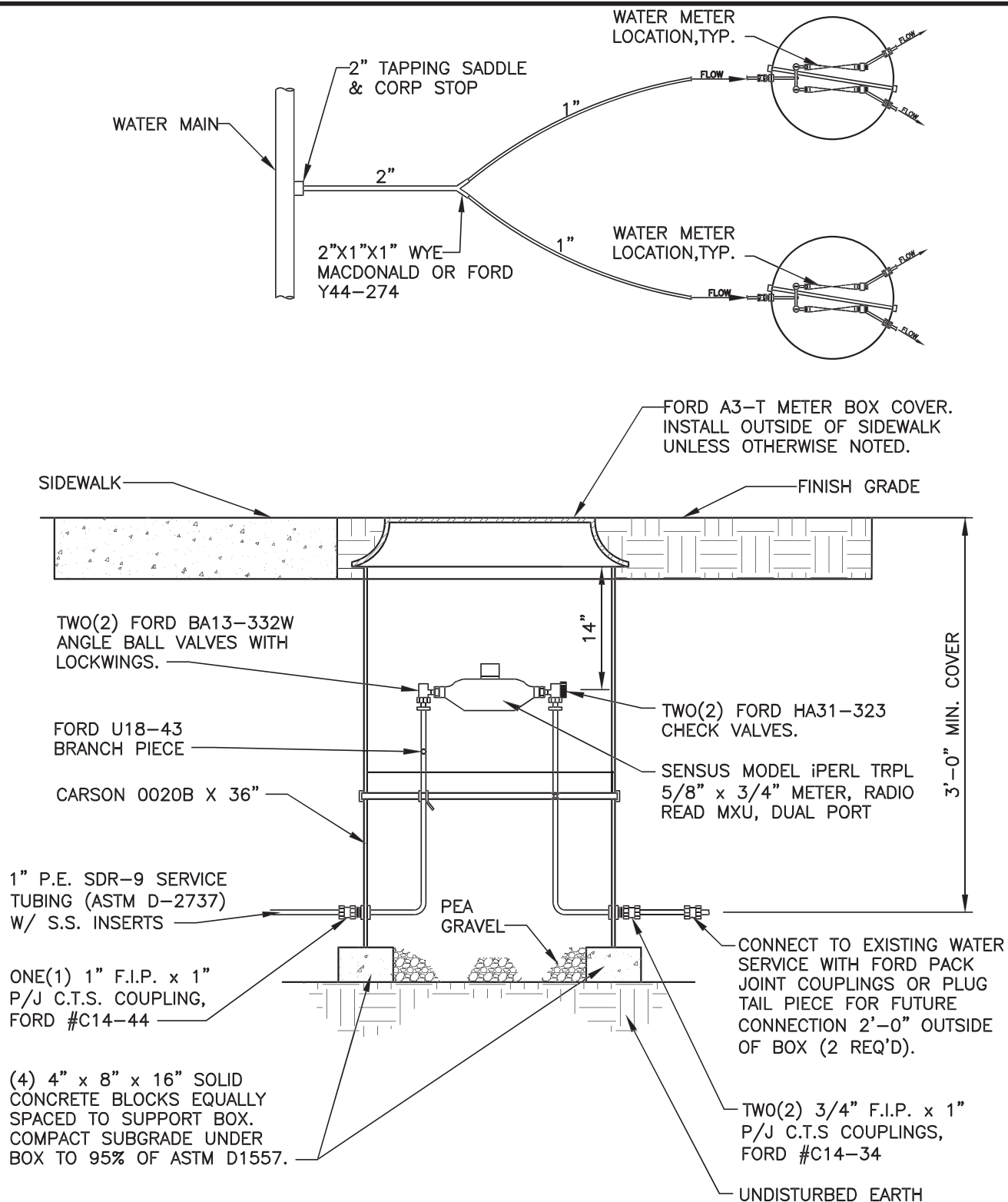
**TOWN OF BRIDGEVILLE  
CONSTRUCTION STANDARDS**

**SINGLE METER PIT  
DETAIL (PREFABRICATED)  
NO SCALE**

**SECTION - 3**

**DRAWING D-2B-10**

P:\STANDARD\DETAILS\8000 City Details\Bridgville DEID-2B-11D.dwg Dec 11, 2017 - 11:32am, (neug)



DATE: SEPTEMBER 2007

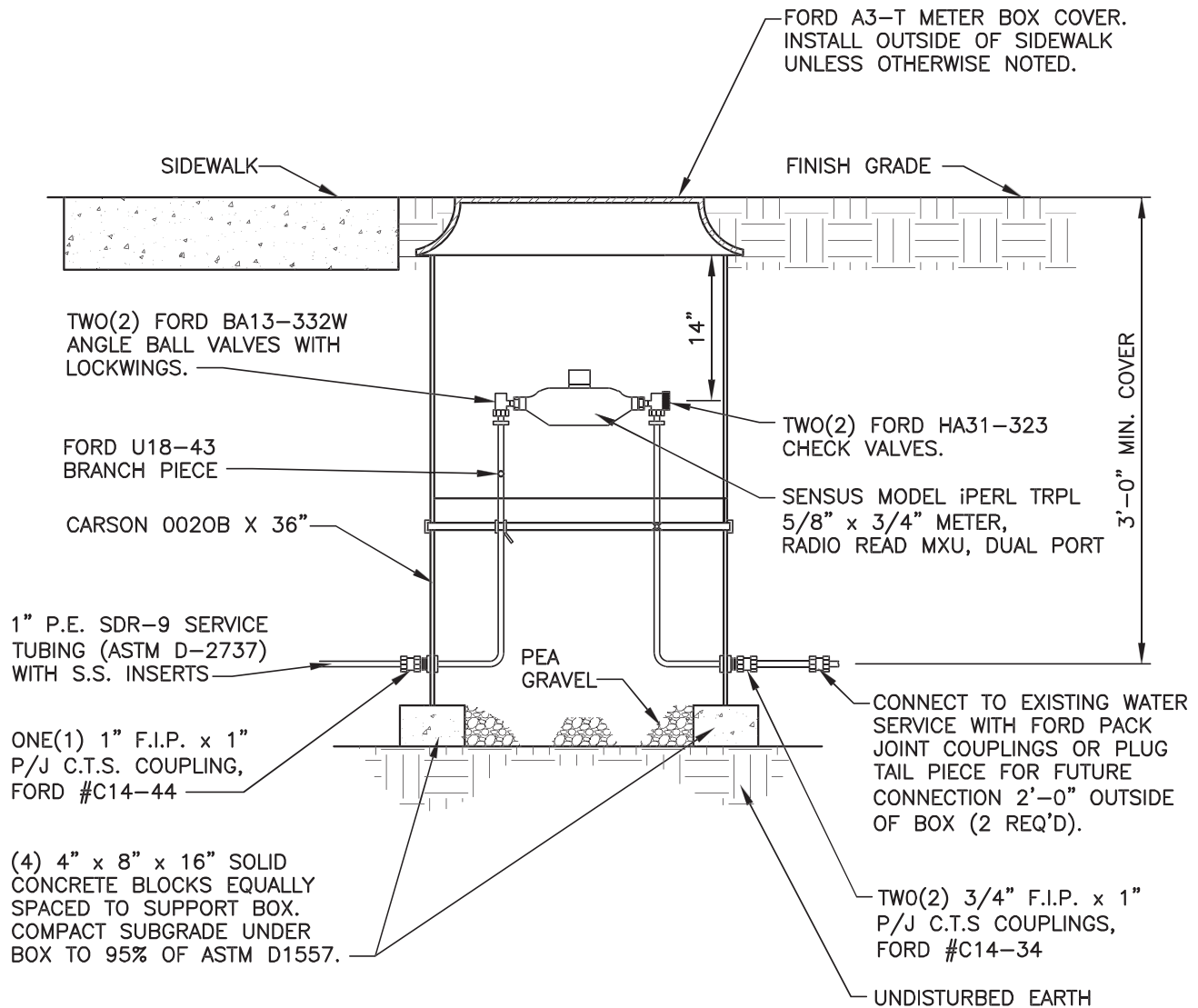
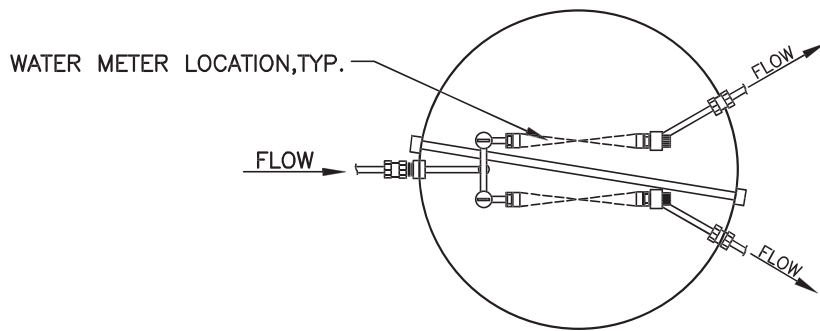
TOWN OF BRIDGEVILLE  
CONSTRUCTION STANDARDS

DOUBLE LOT STANDARD  
DUAL METER PIT DETAIL  
(PREFABRICATED) NO  
SCALE

SECTION - 3

DRAWING D-2B-11D

P:\STANDARD\DETAILS\8000 City Details\Bridgeville DEID-2B-11S.dwg Dec 11, 2017 - 11:32am, (neug)



**DATE: SEPTEMBER 2007**

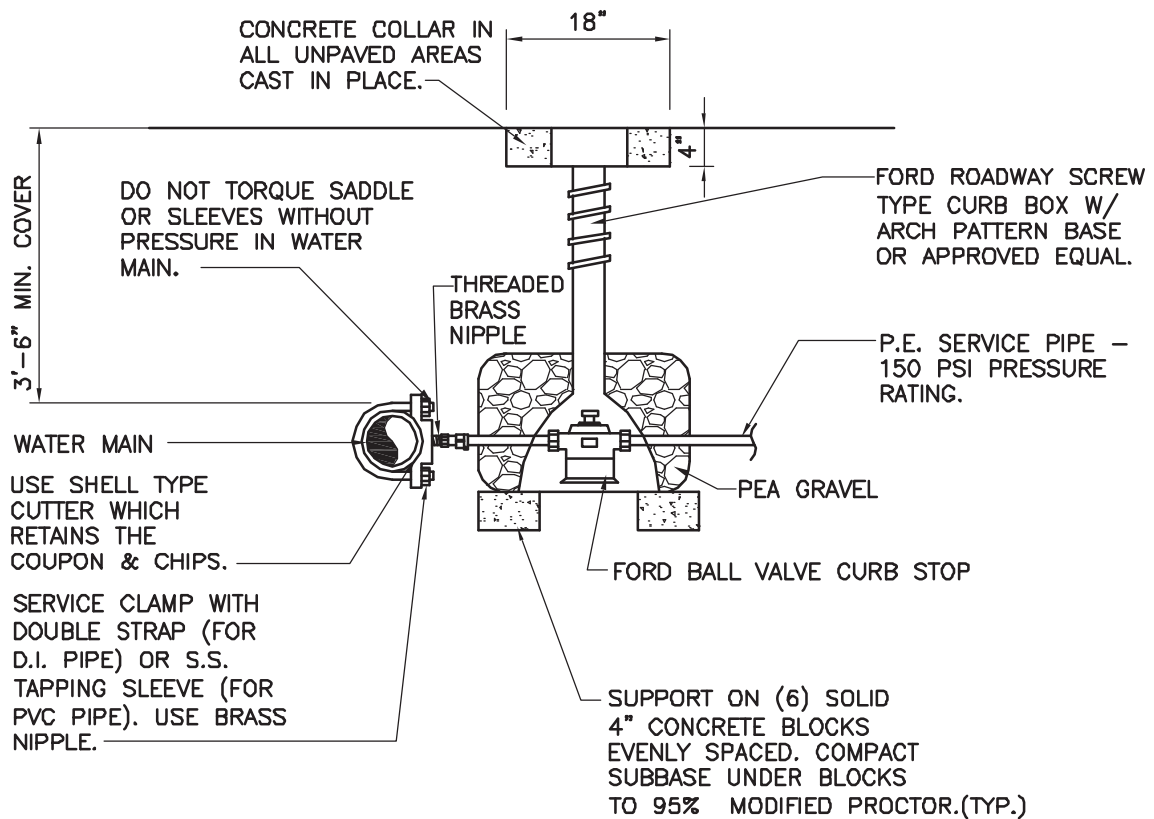
**TOWN OF BRIDGEVILLE  
CONSTRUCTION STANDARDS**

**SINGLE LOT STANDARD DUAL METER PIT DETAIL  
(PREFABRICATED)  
NO SCALE**

**SECTION - 3**

**DRAWING D-2B-11S**

P:\STANDARD\DETAILS\City Details\Bridgeville DE\D-2B-12.DWG May 02, 2008 - 9:48am, (neug)



**DATE: SEPTEMBER 2007**

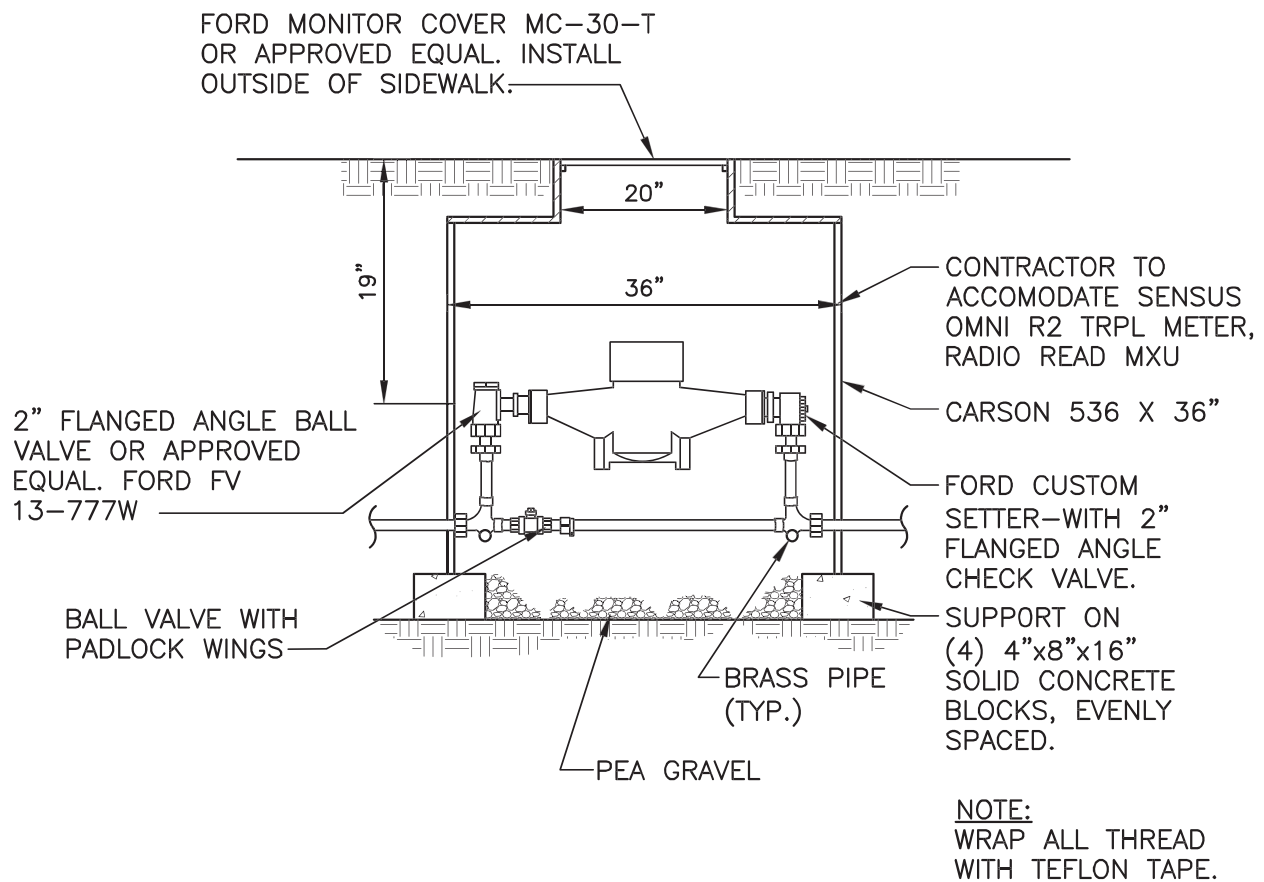
**TOWN OF BRIDGEVILLE  
CONSTRUCTION STANDARDS**

**2\"/>**

**SECTION - 3**

**DRAWING D-2B-12**

P:\STANDARD\DETAILS\8000 City Details\Bridgeville DEID-2B-13.DWG Dec 11, 2017 - 11:33am, (neug)



**DATE: SEPTEMBER 2007**

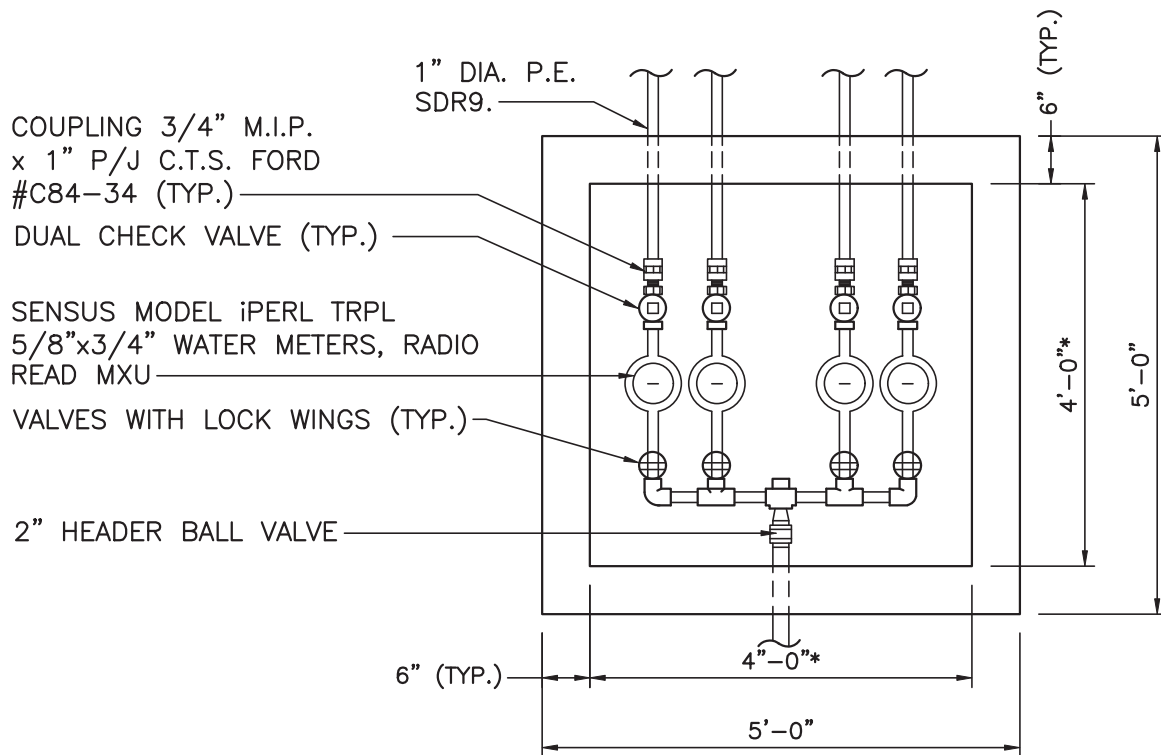
**TOWN OF BRIDGEVILLE  
CONSTRUCTION STANDARDS**

**2" METER SETTER DETAIL  
NO SCALE**

**SECTION - 3**

**DRAWING D-2B-13**

P:\STANDARD\DETAILS\8000 City Details\Bridgeville DE\D-2B-14.DWG Feb 22 , 2018 - 10:43am, (neug)



**NOTES:**

1. \*-CONTRACTOR TO CONFIRM AND INCREASE VAULT SIZE IF NEEDED.
2. ALL F.I.P. SCH 80 PVC FITTINGS SHALL BE STAINLESS STEEL REINFORCED TYPE BY SPEARS.

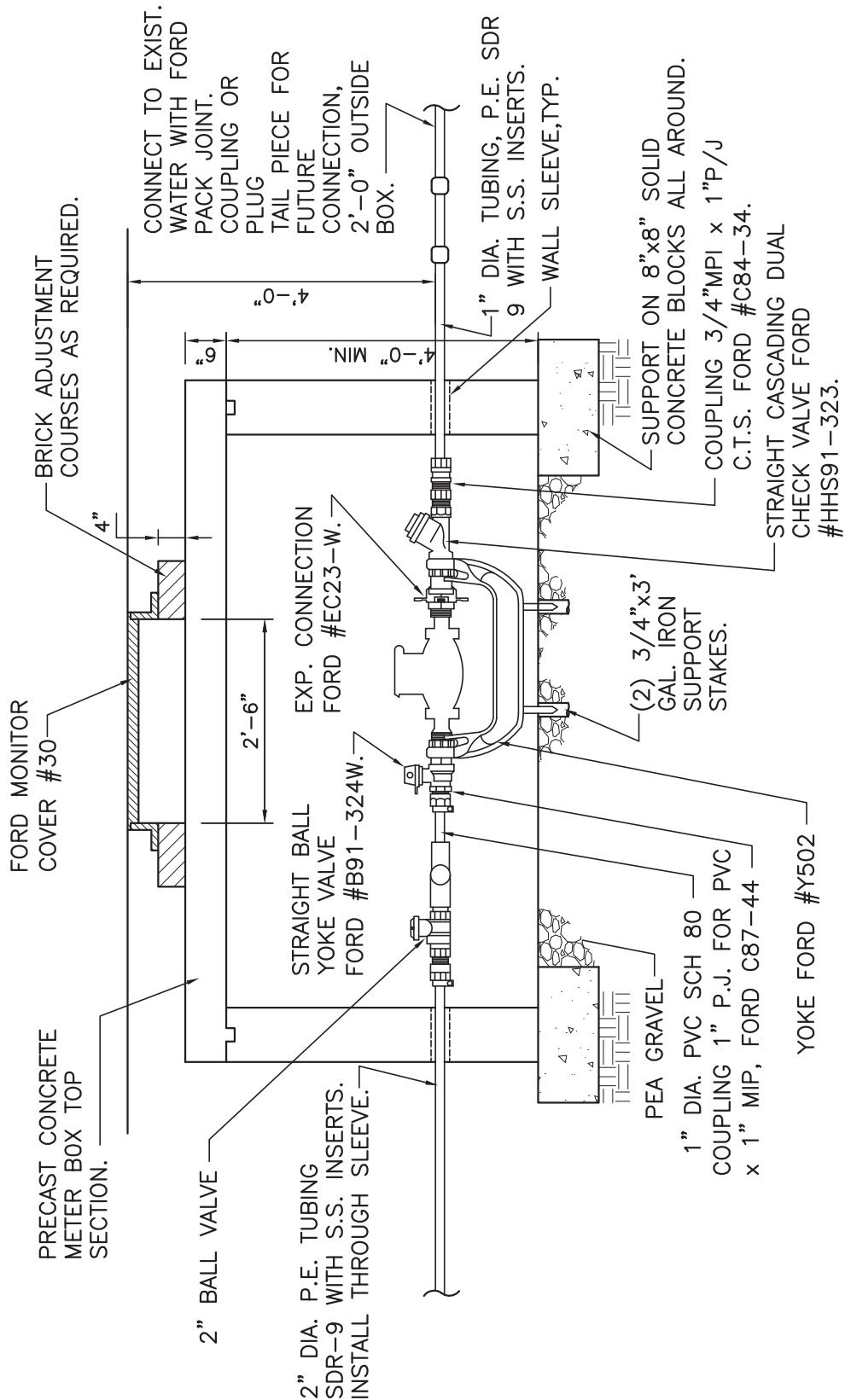
**DATE: SEPTEMBER 2007**

**TOWN OF BRIDGEVILLE  
CONSTRUCTION STANDARDS**

**GANG METER PIT DETAIL PLAN  
NO SCALE**

**SECTION - 3**

**DRAWING D-2B-14**



DATE: SEPTEMBER 2007

TOWN OF BRIDGEVILLE  
CONSTRUCTION STANDARDS

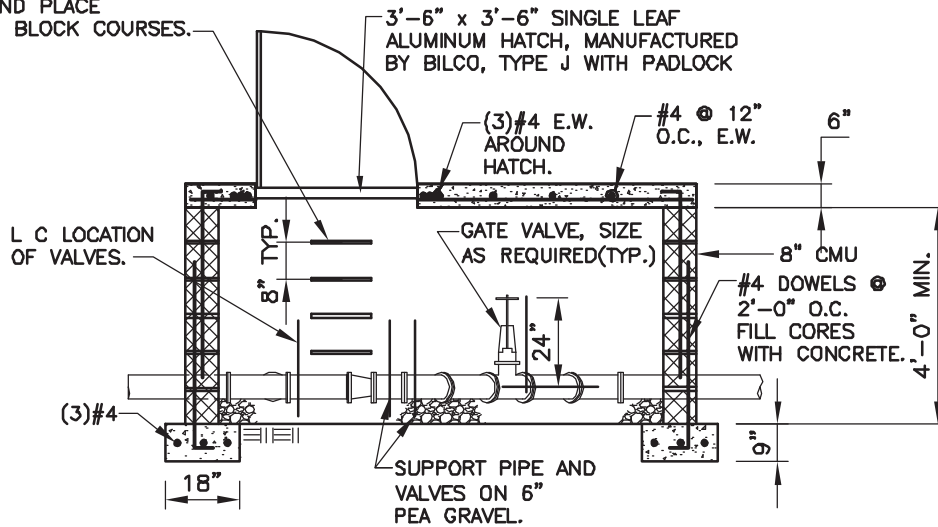
GANG METER PIT DETAIL  
SECTION NO SCALE

SECTION - 3

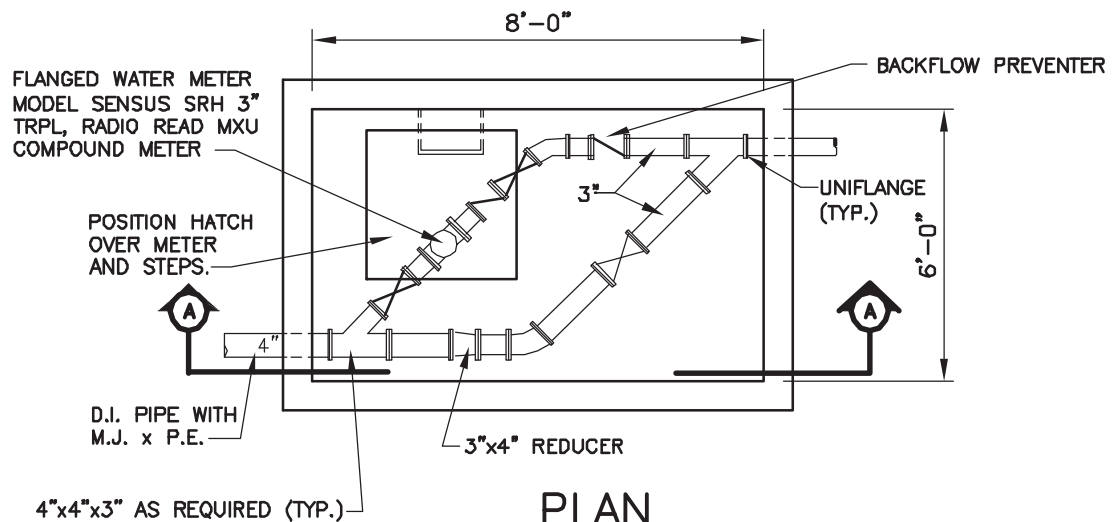
DRAWING D-2B-15

P:\STANDARD\DETAILS\City Details\Bridgeville DE\D-2B-16.DWG May 02, 2008 - 9:47am, (neug)

INSTALL PREFAB MANHOLE  
STEPS AND PLACE  
BETWEEN BLOCK COURSES.



**SECTION "A"**



**PLAN**

**NOTES:**

1. FOR METERS 4" AND LARGER SUBMIT DESIGN FOR REVIEW
2. INTALL OUTSIDE TRAFFIC AREA IF POSSIBLE. OTHERWISE  
DESIGN HATCH AND VAULT FOR HS-20 LOADING.

**DATE: SEPTEMBER 2007**

**TOWN OF BRIDGEVILLE  
CONSTRUCTION STANDARDS**

**INDUSTRIAL / COMMERCIAL METER DETAIL  
NO SCALE**

**SECTION - 3**

**DRAWING D-2B-16**